

a gas supply mechanism that supplies a processing gas into a processing chamber via a plurality of gas supply holes including a plurality of primary gas supply holes and a plurality of circulating gas supply holes,

an evacuating mechanism that evacuates the processing gas from said processing chamber, and

sub 127 a gas circulating mechanism that returns at least a portion of exhaust gas evacuated from said processing chamber to said gas supply mechanism,

wherein said gas supply mechanism includes,

a primary gas supply system that supplies primary gas supplied from a processing gas source into said processing chamber via said primary gas supply holes, and

a circulating gas supply system that supplies at least a portion of the exhaust gas into said processing chamber via said circulating gas supply holes with said primary gas supply system and said circulating gas supply system constituted as systems independent of each other, and

Al + ant wherein the ratio of the number of said primary gas supply holes and the number of said circulating gas supply holes is set equal to the ratio of a target flow rate for said primary gas and a target flow rate for said circulating gas.

2. (Amended) A processing apparatus according to claim 1, wherein the hole radius and the hole density of said gas supply holes are constant over the entire surface.

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3. (Amended) A processing apparatus according to claim 1, wherein the hole radius of said gas supply holes is constant over the entire surface,

wherein the ratio of the area over which said primary gas supply holes are provided and the area over which said circulating gas supply holes are provided is set equal to the ratio of a target flow rate for said primary gas and a target flow rate for said circulating gas, and

wherein the hole density of said circulating gas supply holes is set so as to ensure that the back-pressure is equal to or lower than the rated back-pressure of said evacuating mechanism when said circulating gas is supplied at the target flow rate.

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cont

4. (Amended) A processing apparatus according to claim 1, wherein the hole density of said gas supply holes is constant over the entire surface,

wherein the ratio of the area over which said primary gas supply holes are provided and the area over which said circulating gas supply holes are provided is set equal to the ratio of a target flow rate for said primary gas and a target flow rate for said circulating gas, and

wherein the hole radius of said circulating gas supply holes is set so as to ensure that the back-pressure is equal to or lower than the rated back-pressure of said evacuating mechanism when said circulating gas is supplied at the target flow rate.

5. (Amended) A processing apparatus according to claim 1, wherein the ratio of the number of said primary gas supply holes per unit area and the number of said

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circulating gas supply holes per unit area at said gas supply mechanism is constant over the entire surface of said gas supply mechanism.

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6. (Amended) A processing apparatus according to claim 1, wherein the conductance of said circulating gas supply system is set higher than the conductance at said gas supply mechanism.

8. (Amended) A processing apparatus according to claim 1, wherein a buffer space is provided at least at one of said gas circulating mechanism and said circulating gas supply system.

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9. (Amended) Processing apparatus according to claim 1, wherein a means for filtering said circulating gas is provided at least at one of said gas circulating mechanism and said circulating gas supply system.

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10. (Amended) A processing apparatus according to claim 1, wherein the rate at which said primary gas is supplied through said primary gas supply holes into said processing chamber is set equal to or higher than 500 m / sec.

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11. (New) A processing apparatus according to claim 1, wherein the rate at which said circulating gas is supplied through said circulating gas supply holes into said processing chamber is set equal to or higher than 500 m / sec.

12. (New) A processing apparatus comprising:

a gas supply mechanism that supplies a processing gas into a processing chamber via a plurality of gas supply holes including a plurality of circulating gas supply holes;

an evacuating mechanism that evacuates the processing gas from said processing chamber; and

a gas circulating mechanism that returns at least a portion of exhaust gas evacuated from said processing chamber to said gas supply mechanism,

wherein said gas supply mechanism includes,

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cont a circulating gas supply system configured to supply at least a portion of the exhaust gas into said processing chamber via said circulating gas supply holes,

a primary gas supply system configured to supply a primary gas supplied from a processing gas source through said circulating gas supply holes, and

means for flow rate adjustment of said primary gas provided at said primary gas supply system,

wherein the hole density of the gas supply holes is set so as to ensure that the back-pressure is equal to or lower than the rated back-pressure of the evacuating mechanism when the primary gas and the circulating gas are supplied at their target flow rates.

13. (New) A processing apparatus comprising:

a gas supply mechanism that supplies a processing gas into a processing chamber;

an evacuating mechanism that evacuates the processing gas from said processing chamber; and

a gas circulating mechanism that returns at least a portion of exhaust gas evacuated from said processing chamber to said gas supply mechanism,

wherein said gas supply mechanism includes,

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a circulating gas supply system configured to supply at least a portion of the exhaust gas into said processing chamber via a plurality of circulating gas supply holes,

a first primary gas supply system configured to supply a primary gas supplied from a processing gas source through a plurality of primary gas supply holes,

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a second primary gas supply system configured to supply the primary gas supplied from the processing gas source through said circulating gas supply holes, and

means for flow rate adjustment of said primary gas provided at said second primary gas supply system,

wherein the hole density of the gas supply holes is set so as to ensure that the back-pressure is equal to or lower than the rated back-pressure of the evacuating mechanism when the primary gas and the circulating gas are supplied at their target flow rates.

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